

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 34

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RICHARD A. BARONOSKY
PETER SENAK JR. and
STEVEN H. WOLLINS

Appeal No. 95-3194
Application 08/020,232¹

ON BRIEF

Before THOMAS, JERRY SMITH and BARRETT, Administrative Patent Judges.

JERRY SMITH, Administrative Patent Judge.

DECISION ON APPEAL

¹ Application for patent filed February 19, 1993. According to the appellants this application is a continuation of Application 07/722,349, filed June 27, 1991.

This is a decision on the appeal under 35 U.S.C. § 134 from the examiner's rejection of claims 1 and 3-17. Claim 22 has been allowed. Claims 18-20, 23 and 24 have been indicated as containing allowable subject matter. Claims 2 and 21 have been cancelled.

The disclosed invention pertains to a variable reluctance electric motor having a stator and a rotor. More particularly, the stator has a plurality of magnetic poles formed therein. The rotor also has a plurality of magnetic poles and is positioned for rotation within the stator. Coils of foil wire are disposed about each of the stator poles which are selectively energized to generate electromagnetic fields for controlling the motor.

Representative claim 1 is reproduced as follows:

1. A variable reluctance electric motor comprising:

a stator formed from a magnetic material, said stator being generally hollow and cylindrical in shape and having an inner surface, said stator having a plurality of inwardly extending poles formed thereon which extend longitudinally throughout said inner surface;

a rotor formed from a magnetic material, said rotor being generally cylindrical in shape and having an outer surface, said rotor having a plurality of outwardly extending poles formed thereon which extend longitudinally throughout said outer surface;

means for supporting said rotor for rotation within said stator; and

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a coil of foil wire disposed about each of said stator poles, said coils adapted to be connected to a control circuit for selectively passing electrical current therethrough so as to cause each of said coils to generate an electromagnetic field, said electromagnetic fields selectively attracting said rotor poles toward said stator poles so as to cause said rotor to rotate relative to said stator.

The examiner relies on the following references:

Finegold	4,446,393	May 01, 1984
Obradovic	4,777,419	Oct. 11, 1988
Newberg	4,972,113	Nov. 20, 1990
Shirakawa	4,982,125	Jan. 01, 1991
Konecny	5,015,939	May 14, 1991
Gaser et al. (Gaser)	5,041,749	Aug. 20, 1991
		(filed Apr. 19, 1990)
Sakurai et al. (Sakurai)	64-43044	Feb. 15, 1989
(Japanese Patent Application)		

The admitted prior art in the application.

Claims 1 and 3-17 stand rejected under 35 U.S.C. § 103.

The rejection of claims 1, 3, 4 and 7-15 is based on the teachings of Finegold in view of Obradovic, Konecny or the admitted prior art. The rejection of claims 5 and 6 is based on any of the above combinations and further in view of Newberg. The rejection of claims 16 and 17 is based on any of the combinations applied against claim 1 and further in view of the teachings of Shirakawa, Gaser or Sakurai.

Rather than repeat the arguments of appellants or the examiner, we make reference to the briefs and the answer for the respective details thereof.

OPINION

We have carefully considered the subject matter on appeal, the rejections advanced by the examiner and the evidence of obviousness relied upon by the examiner as support for the rejections. We have, likewise, reviewed and taken into consideration, in reaching our decision, the appellants' arguments set forth in the briefs along with the examiner's rationale in support of the rejections and arguments in rebuttal set forth in the examiner's answer.

It is our view, after consideration of the record before us, that the collective evidence relied upon and the level of skill in the particular art would have suggested to one of ordinary skill in the art the obviousness of the invention as set forth in claims 1, 3-6 and 9-17. We reach the opposite conclusion with respect to claims 7 and 8. Accordingly, we affirm-in-part.

As a general proposition in an appeal involving a rejection under 35 U.S.C. § 103, an examiner is under a burden to make out a prima facie case of obviousness. If that burden is met, the burden of going forward then shifts to the applicant to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a

whole and the relative persuasiveness of the arguments. See In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992); In re Hedges, 783 F.2d 1038, 1039, 228 USPQ 685, 686 (Fed. Cir. 1986); In re Piasecki, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984); and In re Rinehart, 531 F.2d 1048, 1052, 189 USPQ 143, 147 (CCPA 1976).

The examiner has pointed out the teachings of each of the applied references, has pointed out the perceived differences between the applied prior art and the claimed invention, and has reasonably indicated how and why the applied prior art would have been modified and/or combined to arrive at the claimed invention. The examiner has, therefore, at least satisfied the burden of presenting a prima facie case of obviousness. The burden is, therefore, upon appellants to come forward with evidence or arguments which persuasively rebut the examiner's prima facie case of obviousness. Appellants have presented several arguments in response to the examiner's rejection. Therefore, we consider obviousness based upon the totality of the evidence and the relative persuasiveness of the arguments.

1. The rejection of claims 1, 3, 4 and 7-15 as unpatentable over the teachings of Finegold in view of Obradovic, Konecny or the admitted prior art.

Finegold is directed to a dynamoelectric field assembly for use in the starter motor of an automobile. Finegold teaches a stator and rotor having magnetic pole pieces. The pole pieces of Finegold's stator are surrounded by coils of strapping or foil wire. The motor of Finegold is not a variable reluctance motor. Each of Obradovic, Konecny and the admitted prior art teaches a conventional variable reluctance electric motor. Such a motor is described as having a stator and a rotor with magnetic pole pieces. The coils around the stator pole pieces of these motors are presumed to be formed from conventional conductive wire having a circular cross section. Such wire does not meet the definition of foil wire. The coils in Obradovic, Konecny and the admitted prior art are selectively and independently controlled to cause movement of the rotor relative to the stator. It is the position of the examiner that it would have been obvious to the artisan to use the strapping or foil wire of Finegold with the variable reluctance motors of Obradovic, Konecny or the admitted prior art [answer, pages 3-4].

With respect to claim 1, appellants argue that the Finegold structure is so different from the structures disclosed in the other references that a person having ordinary skill in the art would not have considered them in combination [brief,

page 6]. As noted above, Finegold teaches the details of a starter motor for an automobile. The respective coils on the stator of Finegold's motor are connected to each other in series so that an applied current will flow through the coils in sequence. The variable reluctance motors of Obradovic, Konecny and the admitted prior art have the various stator coils unconnected to each other so that a current can be selectively generated through any one of the coils. It is appellants' position that the control of an automobile starter motor is so different from the control of a variable reluctance motor that the artisan would not consider using Finegold's strapping or foil wire for the coils in Obradovic, Konecny or the admitted prior art.

When the breadth of claim 1 is considered, we agree with the examiner that the invention recited therein would have been obvious to the artisan within the meaning of 35 U.S.C. § 103. We do not agree with appellants' assertion that there is no basis to combine the teachings of the applied references. All the references relate to the control of movement of a rotor with respect to a stator. All the references control this movement by the generation of electromagnetic fields in coils surrounding the pole pieces of the stator. The manner in which the coils are

interconnected determines the type of control only, and does not affect the teachings of generating electromagnetic fields by applying current through a coil surrounding a pole piece of the stator. The person skilled in the art of variable reluctance motors would be expected to be familiar with other types of motors which also use magnetic stators and rotors to cause movement of the rotor with respect to the stator.

Appellants argue that if the series connected strapping or foil wire of Finegold were to be placed into the motors of Obradovic, Konecny or the admitted prior art, such motors would not operate as variable reluctance motors any longer [brief, page 7]. The problem with this argument is that it presumes that the artisan has no knowledge whatsoever. The artisan would have known that the coils of a variable reluctance motor must be unconnected as taught by each of Obradovic, Konecny and the admitted prior art. Therefore, the artisan would not retain the series connection of Finegold if the coils were intended for use in a variable reluctance motor.

The question as we see it is whether the artisan would have found it obvious to replace each of the coils of the variable reluctance motors with an individual coil made of strapping or foil wire as taught by Finegold. Appellants argue

that the obviousness of such a replacement is nothing more than a bald conclusion by the examiner [brief, page 8]. However, since the only purpose of the stator coil is to generate an electromagnetic field between the stator and the rotor, and since Finegold clearly teaches that a coil of strapping or foil wire will generate such a field, we are of the view that the artisan would have found it obvious to broadly make the coils for a variable reluctance motor out of strapping or foil wire.

For all the reasons discussed above, we sustain the rejection of claim 1 under 35 U.S.C. § 103. Claims 3, 4 and 14 are grouped with claim 1 so that we also sustain the rejection of these claims.

With respect to claims 7 and 8, appellants argue that there is no suggestion in any of the applied references of the stator flats as recited in these claims [brief, page 10]. The examiner responds that Finegold clearly shows foil wire having flats [answer, page 6]. We see no relevance of the examiner's statement to the stator flats as recited in these claims. Although these claims may be viewed as only slightly modifying the invention of claim 1, the examiner's response is not pertinent to the claim limitations and we can find nothing in the applied references which would have suggested the use of stator

flats as recited in claims 7 and 8. Therefore, we do not sustain the rejection of these claims.

With respect to claim 9, appellants argue that there is no teaching in any of the applied references of a means for retaining the coils on the poles [brief, page 11]. The examiner responds that Finegold clearly teaches such a means [answer, page 6]. We agree with the examiner that Finegold would have suggested to the artisan the broad idea of a means for retaining the stator coils on the stator poles. Therefore, we sustain the rejection of claim 9. Since appellants merely list what is recited in claims 10-13 without any additional arguments as to why these limitations would not have been obvious to the artisan, these claims stand or fall with claim 9 from which they depend. Accordingly, we also sustain the rejection of claims 10-13.

With respect to claim 15, appellants argue that there is no teaching in any of the applied references of the start and finish windings extending circumferentially about the coils [brief, page 12]. The examiner responds that Finegold teaches this feature in his terminals 50 and 76 [answer, page 6]. Although Finegold only shows two terminals for all the coils, we agree with the examiner that the separate coils of a variable reluctance motor are typically situated in a circumferential

manner (see, for example, FIG. 1 of Konecny). Therefore, we sustain the rejection of claim 15.

2. The rejection of claims 5 and 6 as unpatentable over the teachings of Finegold in view of Obradovic, Konecny or the admitted prior art, and further in view of Newberg.

This rejection is explained on page 4 of the answer. Although claims 5 and 6 were rejected using the additional teachings of Newberg, appellants have presented no separate arguments in support of the patentability of these claims. In fact, appellants have indicated that claims 5 and 6 should stand or fall with claim 1 [brief, page 5]. Therefore, since we sustained the rejection of claim 1, we also sustain the rejection of claims 5 and 6.

3. The rejection of claims 16 and 17 as unpatentable over the teachings of Finegold in view of Obradovic, Konecny or the admitted prior art, and further in view of Shirakawa, Gaser or Sakurai.

This rejection is explained in the paragraph bridging pages 4 and 5 of the answer. Specifically, the examiner cites each of Shirakawa, Gaser and Sakurai as a teaching in sensing the position of the rotor with respect to the stator in a motor. The examiner asserts that it would have been obvious to the artisan to use one of these sensing means in the Finegold motor as

modified by any of the secondary reference teachings. Appellants respond that the rotational sensing structures of the applied references are markedly different from the claimed stator sensor pack and rotor sensor pack of claim 17 [brief, pages 12-13]. The examiner reiterates that Shirakawa, Gaser and Sakurai generally teach means for sensing the rotational position of a rotor with respect to a stator [answer, page 6].

It is not entirely clear what is included within the terms "stator sensor pack" and "rotor sensor pack." The specification does not provide a specific definition of these terms, but the specification does give a specific example of these elements in the preferred embodiment of the invention. However, details of the stator sensor pack and the rotor sensor pack have been recited in claim 18, and the examiner has indicated that claim 18 contains allowable subject matter. Thus, we can conclude that the examiner has not read the preferred embodiment into claim 17 which broadly recites a "stator sensor pack" and a "rotor sensor pack." Since appellants submitted separate claims directed to details of these two sensor packs, we agree with the examiner that the sensor packs as broadly recited in claim 17 should be interpreted broadly. Such being the case, we also agree with the examiner that the invention of claim 17

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would have been obvious to the artisan in view of the teachings of the applied references. Therefore, we sustain the rejection of claims 16 and 17.

In summary, we have sustained the rejections with respect to claims 1, 3-6 and 9-17, but we have not sustained the rejections with respect to claims 7 and 8. Accordingly, the decision of the examiner rejecting claims 1 and 3-17 is affirmed-in-part.

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No time period for taking any subsequent action in
connection with this appeal may be extended under 37 CFR
§ 1.136(a).

AFFIRMED-IN-PART

JAMES D. THOMAS)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
JERRY SMITH)	
Administrative Patent Judge)	APPEALS AND
)	
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